5

CLAIMS

What is claimed is:

10   1.   In a computerized device, a method for communicating with an external transmission control protocol device, the method comprising the steps of:

providing an acknowledgment message to the external transmission control protocol device in response to a synchronization message from the external transmission control protocol device;

15   receiving a request message for content from the external transmission control protocol device; and

sending, to the external transmission control protocol device, a reply message having at least a portion of the content, regardless of whether the computerized device received an acknowledgment message from the external

20   transmission control protocol device in response to the acknowledgment message provided by the computerized device to the external transmission control protocol device.

2.   The method of claim 1 wherein the step of sending includes the step of:

25   transmitting the reply message to the external transmission control protocol device in response to request message from the external transmission control protocol device and in the absence of receiving the acknowledgment message from the external transmission control protocol device.

30   3.   The method of claim 1 wherein the step of sending includes the step of:

transmitting the reply message to the external transmission control protocol device in response to the request message from the external transmission

5   control protocol device and in the absence of establishing a transmission control protocol connection.

4.   The method of claim 1 wherein the step of sending includes transmitting a content segment, and wherein the method further comprises the steps of:

10   comparing an acknowledgment number received from the external transmission control protocol device to an aggregate size of the content;

when the acknowledgment number is one of greater than and equal to the aggregate size of the content, refraining from sending another content segment; and

15   when the acknowledgment number is less than the size of the aggregate content, sending another content segment.

5.   The method of claim 4, further comprising the step of:

queuing an acknowledgment message and the acknowledgment number

20   received from the external transmission control protocol device in response to the reply message prior to the step of comparing the acknowledgment number to the aggregate size of the content.

6.   The method of claim 1 further comprising the step of:

25   obtaining first transmission information from a prior message, received from the external transmission control protocol device; and

providing second transmission information to the external transmission control protocol device based on the first transmission information obtained from the external transmission control protocol device.

30

7.   In a transmission control protocol device, a method for communicating with a computerized device, the method comprising the steps of:

5   sending to the computerized device a message requesting content and an acknowledgment number indicating an amount of content previously received by the transmission control protocol device from the computerized device,

       starting a timer;

       when the transmission control protocol device receives content from the

10   computerized device before the timer indicates a predetermined amount of time has expired, incrementing an initial acknowledgment number by a size of a received segment of content to form a new acknowledgment number and sending an acknowledgment message and the new acknowledgment number to the computerized device; and

15   when the transmission control protocol device does not receive content from the computerized device before the timer indicates that the predetermined amount of time has expired, re-sending the acknowledgment message and the initial acknowledgment number.

20 8. The method of claim 7, further comprising the step of:

       re-starting the timer after (i) the transmission control protocol device does not receive the content from the computerized device and (ii) the timer indicates that the predetermined amount of time has expired; and re-sending the acknowledgment message and initial acknowledgment number to the

25   computerized device.

    9. An apparatus for communicating with an external transmission control protocol device, comprising:

       an input/output interface to communicate with at least one external

30   transmission control protocol device;

       a content source to provide content; and

       a controller coupled to the input/output interface and the content source, the controller being configured to:

5
provide an acknowledgment message to the external transmission control protocol device in response to a synchronization message from the external transmission control protocol device,

receive a request message for content from the external
10
transmission control protocol device, and

send, to the external transmission control protocol device, a reply message having at least one portion of the content, regardless of whether the apparatus received an acknowledgment message from the external transmission control protocol device in response
15
to the acknowledgment message provided by the apparatus to the external transmission control protocol device.

10.   The apparatus of claim 9 wherein the controller is configured to send the reply message to the external transmission control protocol device in response to the
20
request message from the external transmission control protocol device and in the absence of receiving the acknowledgment message from the external transmission control protocol device.

11.   The apparatus of claim 9 wherein the controller is configured to transmit, in the
25
reply message, a content segment and further configured to:

compare an acknowledgment number received from the external transmission control protocol device to an aggregate size of the content;

when the acknowledgment number is one of greater than and equal to the aggregate size of the content, refraining from sending another content segment;
30
and

when the acknowledgment number is less than the size of the aggregate content, sending another content segment.

5   12.   The apparatus of claim 11 wherein the controller is further configured to queue an acknowledgment message and the acknowledgment number received from the external transmission control protocol device in response to the reply message prior to comparing the acknowledgment number to the aggregate size of the content.

10

13.   The apparatus of claim 9 wherein the controller is further configured to:

obtain first transmission information from a prior message, received from the external transmission control protocol device; and

provide second transmission information to the external transmission

15   control protocol device based on the first transmission information obtained from the external transmission control protocol device.

14.   An apparatus for communicating with a computerized device, comprising:

an input/output interface to couple with the computerized device;

20   a processor to manipulate content; and

a controller coupled to the input/output interface and the processor, the controller being configured to:

send to the computerized device a message requesting

content and an acknowledgment number indicating an amount of

25   content previously received by the transmission control protocol device from the computerized device,

start a timer;

when the transmission control protocol device receives content from the computerized device before the timer indicates a

30   predetermined amount of time has expired, increment an initial acknowledgment number by a size of a received segment of content to form a new acknowledgment number and send an

5   acknowledgment message and the new acknowledgment number to the computerized device; and

            when the transmission control protocol device does not receive content from the computerized device before the timer indicates that the predetermined amount of time has expired, re-

10   send the acknowledgment message and the initial acknowledgment number.

15.   A computer program product that includes a computer readable medium having instructions stored thereon such that when the instructions are carried out by a

15   transmission control protocol device, the transmission control protocol device is capable of performing the steps of:

            sending to the computerized device a message requesting content and an acknowledgment number indicating an amount of content previously received by the transmission control protocol device from the computerized device,

20   starting a timer;

            when the transmission control protocol device receives content from the computerized device before the timer indicates a predetermined amount of time has expired, incrementing an initial acknowledgment number by a size of a received segment of content to form a new acknowledgment number and sending

25   an acknowledgment message and the new acknowledgment number to the computerized device; and

            when the transmission control protocol device does not receive content from the computerized device before the timer indicates that the predetermined amount of time has expired, re-sending the acknowledgment message and the

30   initial acknowledgment number.

16.   An apparatus for communicating with a computerized device, comprising:

            (i) an input/output interface to couple with the computerized device;

5   (ii) a processor to manipulate content;

(iii) means, coupled to the input/output interface and the processor, for sending to the computerized device a message, requesting content, and an acknowledgment number indicating an amount of content previously received by the transmission control protocol device from the computerized device;

10   (iv) means, coupled to the input/output interface and the processor, for starting a timer;

(v) means, coupled to the input/output interface and the processor, for incrementing an initial acknowledgment number by a size of a received segment of content to form a new acknowledgment number and sending an

15   acknowledgment message and the new acknowledgment number to the computerized device when the transmission control protocol device receives content from the computerized device before the timer indicates a predetermined amount of time has expired; and

(vi) means, coupled to the input/output interface and the processor, for re-

20   sending the acknowledgment message and the initial acknowledgment number to the computerized device when the transmission control protocol device does not receive content from the computerized device before the timer indicates that the predetermined amount of time has expired.

25   17.   A computer system, comprising:

a transmission control protocol client, which is configured to send a synchronization message and a request message to a server; and

the server, which is configured to (i) provide an acknowledgment message to the client in response to the synchronization message from the transmission

30   control protocol client, (ii) receive the request message for content from the transmission control protocol client, and (iii) send, to the transmission control protocol client, a reply message having at least a portion of content, regardless of whether the server received an acknowledgment message from the transmission

5   control protocol client in response to the acknowledgment message provided by the server to the transmission control protocol client.

18.   The computer system of claim 17 wherein the server is configured to send the reply message to the transmission control protocol client in response to the

10   request message from the transmission control protocol client and in the absence of receiving the acknowledgment message from the transmission control protocol client.

19.   The computer system of claim 17 wherein the transmission control protocol client

15   is configured to

         (i) start a timer,

         (ii) when the transmission control protocol client receives content from the server before the timer indicates a predetermined amount of time has expired, increment an initial acknowledgment number by a size of a received segment of

20   content to form a new acknowledgment number and send an acknowledgment message and the new acknowledgment number to the server, and

         (iii) when the transmission control protocol client does not receive content from the server before the timer indicates that the predetermined amount of time has expired, re-send the acknowledgment message and the initial

25   acknowledgment number.

20.   The computer system of claim 19 wherein the server is configured to transmit, in a reply message, a content segment and further configured to

         (i) compare the acknowledgment number received from the transmission

30   control protocol client to an aggregate size of the content,

         (ii) when the acknowledgment number is one of greater than and equal to the aggregate size of the content, refrain from sending another content segment, and

5   (iii) when the acknowledgment number is less than the size of the
aggregate content, send another content segment.

21.   The computer system of claim 19 wherein the transmission control protocol client
is configured to re-start the timer after (i) the transmission control protocol client
10   does not receive the content from the server and (ii) the timer indicates that the
predetermined amount of time has expired; and re-send the acknowledgment
message and initial acknowledgment number to the server.

22.   The computer system of claim 19 wherein the server is configured to queue an
15   acknowledgment message and the acknowledgment number received from the
transmission control protocol client in response to the reply message prior to the
step of comparing the acknowledgment number to the size of the content.

23.   The computer system of claim 19 wherein the server is further configured to:
20   obtain first transmission information from a prior message, received from
the transmission control protocol client; and
           provide second transmission information to transmission control protocol
client based on the first transmission information obtained from transmission
control protocol client.

25

24.   The computer system of 19 wherein
           (i) the transmission control protocol client is a conventional transmission
control protocol client,
           (ii) the computer system further comprises a processor configured to
30   process at least one of a multiple of operating system, transmission control
protocol, conventional transmission control protocol, other system and application
program processes simultaneously, and

5 (iii) when the conventional transmission control protocol client does not receive content from the server before the timer indicates that the predetermined amount of time has expired, an application process of the at least one of a multiple of operating system, transmission control protocol, conventional transmission control protocol, other system and application program processes creates and

10 transmits a payload received by the conventional transmission control protocol client causing the conventional transmission control protocol client to transmit the payload and re-send the acknowledgment message and the initial acknowledgment number.

15 25. A computer program product that includes a computer readable medium having instructions stored thereon such that, when the instructions are carried out by a computerized device, the computerized device is capable of performing the steps of:

 providing an acknowledgment message to an external transmission control

20 protocol device in response to a synchronization message from the external transmission control protocol device;

 receiving a request message for content from the external transmission control protocol device; and

 sending, to the external transmission control protocol device, a reply

25 message having at least a portion of the content, regardless of whether the computerized device received an acknowledgment message from the external transmission control protocol device in response to the acknowledgment message provided by the computerized device to the external transmission control protocol device.

30

 26. The computer program product of claim 25 wherein the instructions, when carried out by the computerized device, cause the computerized device to send the reply message to the external transmission control protocol device in response to the

5   request message from the external transmission control protocol device and in the
           absence of receiving the acknowledgment message from the external transmission
           control protocol device.

27.   An apparatus for communicating with an external transmission control protocol
10   device, comprising:

                   (i) an input/output interface to communicate with at least one external
           transmission control protocol device;

                   (ii) a content source to provide content;

                   (iii) means, coupled to the input/output interface and the content source,
15   for providing an acknowledgment message to the external transmission control
           protocol device in response to a synchronization message from the external
           transmission control protocol device,

                   (iv) means, coupled to the input/output interface and the content source,
           for receiving a request message for content from the external transmission control
20   protocol device; and

                   (v) means, coupled to the input/output interface and the content source, for
           sending, to the external transmission control protocol device, a reply message
           having at least a portion of the content, regardless of whether the apparatus
           received an acknowledgment message from the external transmission control
25   protocol device in response to the acknowledgment message provided by the
           apparatus to the external transmission control protocol device.

28.   The apparatus of claim 27 wherein the means, coupled to the input/output
           interface and the content source, includes:
30   means for sending the reply message to the external transmission control
           protocol device in response to the request message from the external transmission
           control protocol device and in the absence of receiving the acknowledgment
           message from the external transmission control protocol device.